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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/541,444	03/31/2000	Erik C Cota-Robles	042390.P7920	3693

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EXAMINER
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OPIE, GEORGE L

ART UNIT	PAPER NUMBER
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2126

DATE MAILED: 10/31/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	09/541,444	Cota-Robles	
	Examiner	Art Unit	
	George L. Opie	2151	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 10-29 is/are rejected.
- 7) ☒ Claim(s) 9 and 30 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. § 119**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All   b) ☐ Some \* c) ☐ None of the CERTIFIED copies of the priority documents have been:
1. ☐ received.
2. ☐ received in Application No. (Series Code / Serial Number) \_\_\_\_\_.
3. ☐ received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

**Attachment(s)**

- |  |   |
|--|---|
| 14) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                     | 17) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____                         |
| 15) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                            | 18) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)                        |
| 16) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) <u>4-11</u> . | 19) <input checked="" type="checkbox"/> Other: Text Docs for USP6,421,702 USP6,412,035 USP6,092,095 |

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**DETAILED ACTION****1. Request for copy of Applicant's response on floppy disk:**

Please help expedite the prosecution of this application by including, along with your amendment response in paper form, an electronic file copy in WordPerfect, Microsoft Word, or in ASCII text format on a 3½ inch IBM format floppy disk.

Please include all pending claims along with your responsive remarks. Only the paper copy will be entered -- your floppy disk file will be considered a duplicate copy. Signatures are not required on the disk copy. The floppy disk copy is not mandatory, however, it will help expedite the processing of your application. Your cooperation is appreciated.

**2. Claim Objections**

Claims 1-3 et al contain parenthetical terms. Claims cannot contain parentheses except in reference to a figure. To avoid confusion, parentheses should only be used for reference characters corresponding to elements recited in the drawings and used in conjunction with the recitation of the same element in the claims. See MPEP608.01(m). Appropriate correction is required.

3. Claims 9 and 30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

4. The U.S. Patents used in the art rejections below have been provided as text documents which correspond to the U.S. Patents. The relevant portions of the text documents are cited according to page and line numbers in the art rejections below. For the convenience of Applicant, the cited sections are highlighted in the *text documents*. Consistent with Office procedure, the U.S. Patents corresponding to the *text documents* are also included with this action.

**5. Claim Rejections - 35 U.S.C. § 102**

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant

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for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

6. Claims 1-3, 5-6, 10-13 and 27 are rejected under 35 U.S.C. § 102(e) as being anticipated by Gulick (U.S. Patent 6,421,702).

As to claim 1, Gulick teaches a method for scheduling a plurality of virtual machines (scheduling of a plurality of isochronous tasks, p7 48 – p8 5) comprising:

determining a respective resource requirement (X) for each virtual machine (VM) (determining the maximum percentage of the operating system bandwidth allocated to isochronous tasks, p12 5-18)

determining a respective interrupt period (Y) for each VM (interrupt is variable based on the interval of the currently executing isochronous tasks, p5 44-51) and

scheduling said plurality of VMs based, at least in part, on said respective X and Y values (scheduler 218 dynamically sets the timer ... and passes control to the first task, p6 12-35).

As to claims 2-3, Gulic (p3 40-51) teaches "[e]ach isochronous task informs the operating system of an execution interval and a duration."

As to claims 5-6, note the rejections of claims 2-3 above.

As to claims 10-13, note the discussions of claims 1, 6, 3 and 2 respectively. Claims 10-13 are the same as claims 1, 6, 3 and 2, except claims 10-13 are computer program product claims and claims 1, 6, 3 and 2 are method claims.

As to claim 27, note the rejection of claim 1 above. Claim 27 is the same as claim 1, except claim 27 is an apparatus claim and claim 1 is a method claim.

7. Claim Rejections - 35 U.S.C. § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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8. Claims 4, 7-8, 14-16 and 28-29 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Gulick in view of Maytal (U.S. Patent 6,092,095).

As to claim 4, Maytal teaches the service manager 50 for maintaining resource requirements (p2 40-45 and pages 6-8). It would have been obvious to combine Maytal's teachings with Gulick because the service manager would facilitate administration efficacy by adjusting resource allocations to each VM as its requirements warrant for acceptable operations and optimal system usage/performance.

As to claim 7, note the rejection of claim 4 above.

As to claim 8, Maytal (p8 27-56) teaches performance monitoring for scheduling and adjusting resource requirements as recited. It would have been obvious to combine Maytal's teachings with Gulick because the monitoring of a VM's actual usage would enable the system to perform resource allocation tuning for continually maximizing the system's capabilities.

As to claims 14-16, note the discussions of claims 4 and 8 above. Claims 14-16 are the same as claims 4 and 8, except claims 14-16 are computer program product claims and claims 4 and 8 are method claims.

As to claims 28-29, note the discussions of claims 4 and 8 supra. Claims 28-29 are the same as claims 4 and 8, except claims 28-29 are apparatus claims and claims 4 and 8 are method claims.

9. Claims 17-26 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Webber (U.S. Patent 6,412,035).

As to claim 17, Webber (p5 10-24) teaches the determining interrupt values by initializing the interrupts and generating virtual interrupts, and filtering (Fig. 2, page 5) and adjusting the interrupt period values (page 6 47-52). Although Webber does not explicitly disclose the rejecting aperiodic interrupts, it would have been an obvious modification for one skilled in the art to have included this rejection in the filtering taught by Webber.

As to claims 18-19, Webber (p4 14-40) teaches the scheduling VMs with respect to resource requirement values as claimed.

As to claims 20-21, Webber (p2 38 – p3 9) teaches scheduling VMs contingent on interrupt frequency and resource requirements, and for one skilled in the art, the recited resource requirement adjustments would have naturally flowed from

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Webber's interrupt management teachings for handling real-time operations in general purpose operating systems.

10. The prior art of record and not relied upon is considered pertinent to the applicant's disclosure. Each reference disclosed below is relevant to one or more of the Applicant's claimed invention.

U.S. Patent No. 6,374,286 to Gee et al. which teaches the resource management and scheduling of multiple virtual machines;

U.S. Patent No. 6,075,938 to Bugnion et al. which teaches the virtual machine monitors for coordinating/adjusting VM operations.

#### **11. Contact Information:**

PTO Policy for Facsimile Submissions:


- ☐ AFTER-FINAL faxes must be signed and sent to (703) 746-7238.
- ☐ OFFICIAL faxes must be signed and sent to (703) 746-7239.
- ☐ NON OFFICIAL faxes should be sent to (703) 746-7240.

All OFFICIAL faxes will be handled and entered by the docketing personnel. The date of entry will correspond to the actual FAX reception date unless that date is a Saturday, Sunday, or a Federal Holiday within the District of Columbia, in which case the official date of receipt will be the next business day. The application file will be promptly forwarded to the Examiner unless the application file must be sent to another area of the Office, e.g., Finance Division for fee charging, etc.

- ☐ All responses sent by U.S. Mail should be mailed to:  
**Commissioner for Patents**  
**PO Box 1450**  
**Alexandria, VA 22313-1450**
- ☐ Hand-delivered responses should be brought to Crystal Park Two, 2021 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist). All hand-delivered responses will be handled and entered by the docketing personnel. Please do not hand deliver responses directly to the Examiner.
- ☐ Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist at **(703) 305-9600**.

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□ Any inquiry concerning this communication or earlier communications from the examiner should be directed to George Opie at (703) 308-9120 or via e-mail at *George.Opie@uspto.gov*. Internet e-mail should not be used where sensitive data will be exchanged or where there exists a possibility that sensitive data could be identified unless there is an express waiver of the confidentiality requirements under 35 U.S.C. 122 by the Applicant. Sensitive data includes confidential information related to patent applications.



**ZARNI MAUNG**  
PRIMARY EXAMINER